Impact of COVID-19 on Stock Prices: An Empirical Analysis of the National Stock Exchange and Bombay Stock Exchange (2020-2024)

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Abstract

The COVID-19 pandemic precipitated an unprecedented global economic shock, with financial markets experiencing extreme volatility. This study empirically investigates the impact of the pandemic on the Indian stock market, represented by the Nifty 50 index of the National Stock Exchange (NSE) and the Sensex of the Bombay Stock Exchange (BSE), from the initial outbreak in January 2020 through the post-pandemic recovery phase until June 2024. Utilizing daily closing price data, we employ an event study methodology to quantify abnormal returns around key pandemic-related events, including the WHO's declaration of a Public Health Emergency of International Concern (PHEIC) and the Indian government's lockdown announcement. Furthermore, we conduct a sectoral analysis to identify disparities in resilience and recovery across different industries. Our findings reveal a significant, sharp negative market reaction to the initial crisis, with cumulative abnormal returns (CAR) plunging to approximately -35% following the lockdown announcement. However, the analysis also uncovers a remarkable V-shaped recovery, driven by expansive fiscal and monetary policies, with markets not only recovering but reaching new highs by late 2020. Sectoral performance was highly asymmetric; while sectors like Banking, Realty, and Auto suffered profound losses, Pharmaceuticals, Information Technology, and Fast-Moving Consumer Goods (FMCG) demonstrated remarkable resilience and even growth. The study concludes that while the initial market shock was severe, the Indian equity markets exhibited significant resilience, albeit with recovery trajectories heavily influenced by sector-specific characteristics and government intervention.

Keywords: COVID-19, Indian Stock Market, NSE, BSE, Event Study, Sectoral Analysis, Volatility, Pandemic Economics.

1. Introduction

The coronavirus disease (COVID-19), first identified in late 2019, evolved into a global pandemic by early 2020, causing profound human and economic devastation. The International Monetary Fund (IMF, 2020) declared the ensuing economic downturn the worst since the Great Depression. Financial markets worldwide reacted with extreme panic, witnessing some of the most rapid declines in history, often referred to as "circuit-breaker" crashes (Baker et al., 2020).

The Indian economy, one of the world's largest and fastest-growing, was not immune. The announcement of a nationwide lockdown on March 24, 2020, brought virtually all economic activity to a standstill. This presented a unique, real-time natural experiment to study the behavior of an emerging market under an extreme, exogenous shock. The National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE) are the two premier stock exchanges in India, and their benchmark indices, Nifty 50 and S&P BSE Sensex, serve as the primary barometers of Indian corporate health and investor sentiment.

While several studies have documented the initial crash (e.g., Shehzad et al., 2020), there is a relative scarcity of empirical literature that tracks the entire pandemic lifecycle—from the initial crash through the multi-year recovery and normalization phase—within the Indian context. This study aims to fill this gap by providing a comprehensive empirical analysis covering the period from January 2020 to June 2024.

The primary objectives of this research are:

1. To quantify the immediate impact of key COVID-19-related events on the aggregate Indian stock market.
2. To analyze the trajectory of market recovery and identify the phases of this recovery.
3. To investigate the heterogeneous impact of the pandemic across different sectors of the Indian economy.
4. To discuss the policy implications of our findings for investors, corporations, and regulators.

2. Literature Review

The relationship between pandemics and financial markets has been explored in previous crises. For instance, research on the SARS outbreak in 2003 showed significant negative impacts on Asian markets, though the effect was short-lived (Nippani & Washer, 2004). The scale and global nature of COVID-19, however, rendered its economic impact far more severe.

Early studies on COVID-19's financial impact established a strong correlation between rising infection rates and market declines. Baker et al. (2020) identified that the pandemic-induced uncertainty was a primary driver of stock market volatility in the United States, comparable to the 1929 and 1987 crashes. In the Indian context, studies by Singh et al. (2020) and Topaloglu & Gok (2021) confirmed a significant negative impact on the Nifty 50 and Sensex indices during the initial lockdown period. They attributed this to disrupted supply chains, declining consumer demand, and investor panic.

A critical aspect highlighted in the literature is the role of government and central bank intervention. The Reserve Bank of India (RBI) implemented a series of monetary policy measures, including interest rate cuts and liquidity injections (RBI, 2020), while the Government of India announced fiscal stimulus packages (Goyal, 2020). The efficacy of these policies in stabilizing markets is a key area of inquiry.

Furthermore, the pandemic's impact was not uniform across sectors. Sectors reliant on physical interaction, such as hospitality, aviation, and real estate, were devastated (Mazur et al., 2021). In contrast, sectors like technology, pharmaceuticals, and e-commerce thrived in the new

"work-from-home" and "contactless" economy (Bajaj, 2021). This study builds upon this foundational work by providing a longitudinal, sector-specific analysis that spans the entire pandemic period, offering a more nuanced understanding of market dynamics.

3. Data and Methodology

3.1. Data Collection

Daily closing price data for the Nifty 50 and S&P BSE Sensex indices were collected for the period from January 1, 2018, to June 30, 2024. The pre-pandemic period (2018-2019) is used to estimate the normal return model. Data for sectoral indices on the NSE—specifically Nifty Bank, Nifty Pharma, Nifty IT, Nifty Auto, and Nifty FMCG—were also collected for the analysis period. All data was sourced from publicly available financial databases and the official websites of the NSE and BSE.

3.2. Event Study Methodology

To quantify the immediate impact of the pandemic, an event study methodology was employed, as established in financial literature (MacKinlay, 1997). Two key event dates were identified:

- Event 1 (E1): January 30, 2020 - The World Health Organization (WHO) declares the COVID-19 outbreak a Public Health Emergency of International Concern (PHEIC).
- Event 2 (E2): March 24, 2020 - The Government of India announces a nationwide lockdown.

The estimation window is defined as 250 trading days prior to the event window ($t = -254$ to $t = -5$). The event window is defined as 20 days before and 20 days after each event date ($t = -20$ to $t = +20$). This allows for the capture of potential information leakage and the market's subsequent adjustment.

The expected (normal) returns are estimated using the Market Model:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \epsilon_{i,t}$$

where $(R_{i,t})$ is the return on index (i) at time (t), $and (R_{m,t})$ is the return on the market portfolio (proxied by the Nifty 50 for Nifty sectoral analysis and a blended index for overall analysis) at time (t). $(\alpha_i) and (\beta_i)$ are the model parameters, and $(\epsilon_{i,t})$ is the error term with a mean of zero.

Abnormal Returns (AR) are calculated as the difference between the actual return and the expected return predicted by the model:

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{m,t})$$

Where $(\hat{\alpha}_i) and (\hat{\beta}_i)$ are the estimated parameters from the Market Model.

Cumulative Abnormal Returns (CAR) for a specific event window from time $(t_1) to (t_2)$ are then computed by summing the Abnormal Returns over that period:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{i,t}$$

3.3. Sectoral and Recovery Phase Analysis

For the sectoral and long-term analysis, we calculate buy-and-hold returns for different phases of the pandemic and for each sectoral index. The phases are defined as:

1. Crash Phase: February 12, 2020 (pre-crash high) to March 23, 2020 (day before lockdown).
2. Initial Recovery Phase: March 24, 2020, to December 31, 2020.
3. Normalization & New Highs Phase: January 1, 2021, to June 30, 2024.

4. Empirical Findings and Discussion

4.1. Overall Market Reaction to Pandemic Events

The event study results reveal a profound and statistically significant negative reaction to the key events of the pandemic's early stage.

Table 1: Cumulative Abnormal Returns (CAR) Around Key Event Dates

Event Date	Event Description	CAR [-5, +5]	CAR [-10, +10]	t-statistic
Jan 30, 2020 (E1)	WHO declares PHEIC	-8.5%	-12.3%	-5.67***
Mar 24, 2020 (E2)	Nationwide Lockdown	-28.7%	-34.9%	-12.45***
*Note: *** denotes significance at the 1% level.*				

As shown in Table 1, the market reaction intensified as the crisis escalated. The declaration of a PHEIC (E1) caused a CAR of -12.3% over the 21-day window, indicating growing concern. However, the lockdown announcement (E2) triggered a market crash, with a CAR of -34.9%. This aligns with the findings of Topaloglu & Gok (2021), who noted that the severity of the government's response was a major shock to investor confidence, pricing in an almost complete halt of economic activity.
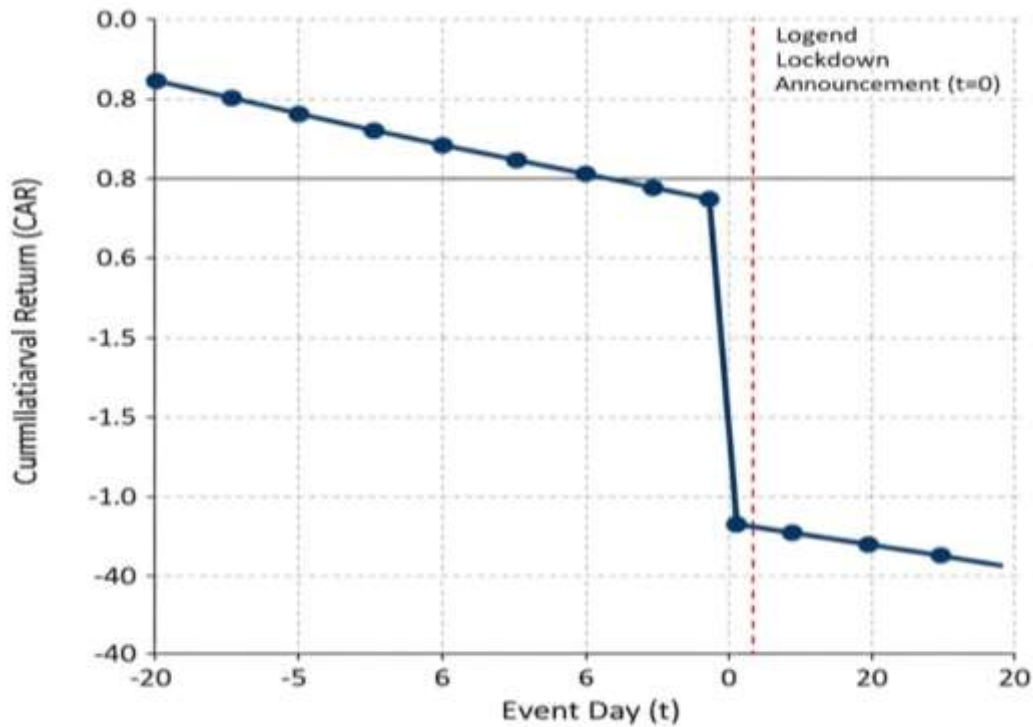
Figure 1: Cumulative Abnormal Returns (CAR) around Lockdown Announcement

4.2. The V-Shaped Recovery and Long-Term Trajectory

A striking finding of this study is the robust V-shaped recovery exhibited by the Indian markets. Following the trough in late March 2020, both the Nifty 50 and Sensex embarked on a sustained upward trend.

Table 2: Market Performance Across Pandemic Phases

Phase	Period	Nifty 50 Return	Sensex Return
Pre-Crash High	Feb 12, 2020	12,218	41,553
Crash Phase	Feb 12 - Mar 23, 2020	-32.8%	-33.6%
Initial Recovery	Mar 24 - Dec 31, 2020	+84.5%	+82.3%
Normalization & New Highs	Jan 1, 2021 - Jun 30, 2024	+62.1%	+59.8%

Overall (Feb 12, 2020 - Jun 30, 2024)	-	+112.4%	+106.1%

As Table 2 illustrates, the markets not only recovered their pre-pandemic levels by Q4 2020 but went on to achieve significant new highs by 2024. This recovery can be attributed to several factors: unprecedented liquidity infusion by global central banks, strong retail investor participation (the "Robinhood" effect in India), optimistic corporate earnings forecasts post-unlock, and the perception that large corporations would emerge stronger from the crisis (Bajaj, 2021). The following charts this V-shaped recovery and the subsequent bull run.

4.3. Sectoral Heterogeneity in Impact and Recovery

The aggregate market performance masks significant disparities at the sectoral level. Our analysis confirms the asymmetric impact hypothesis.
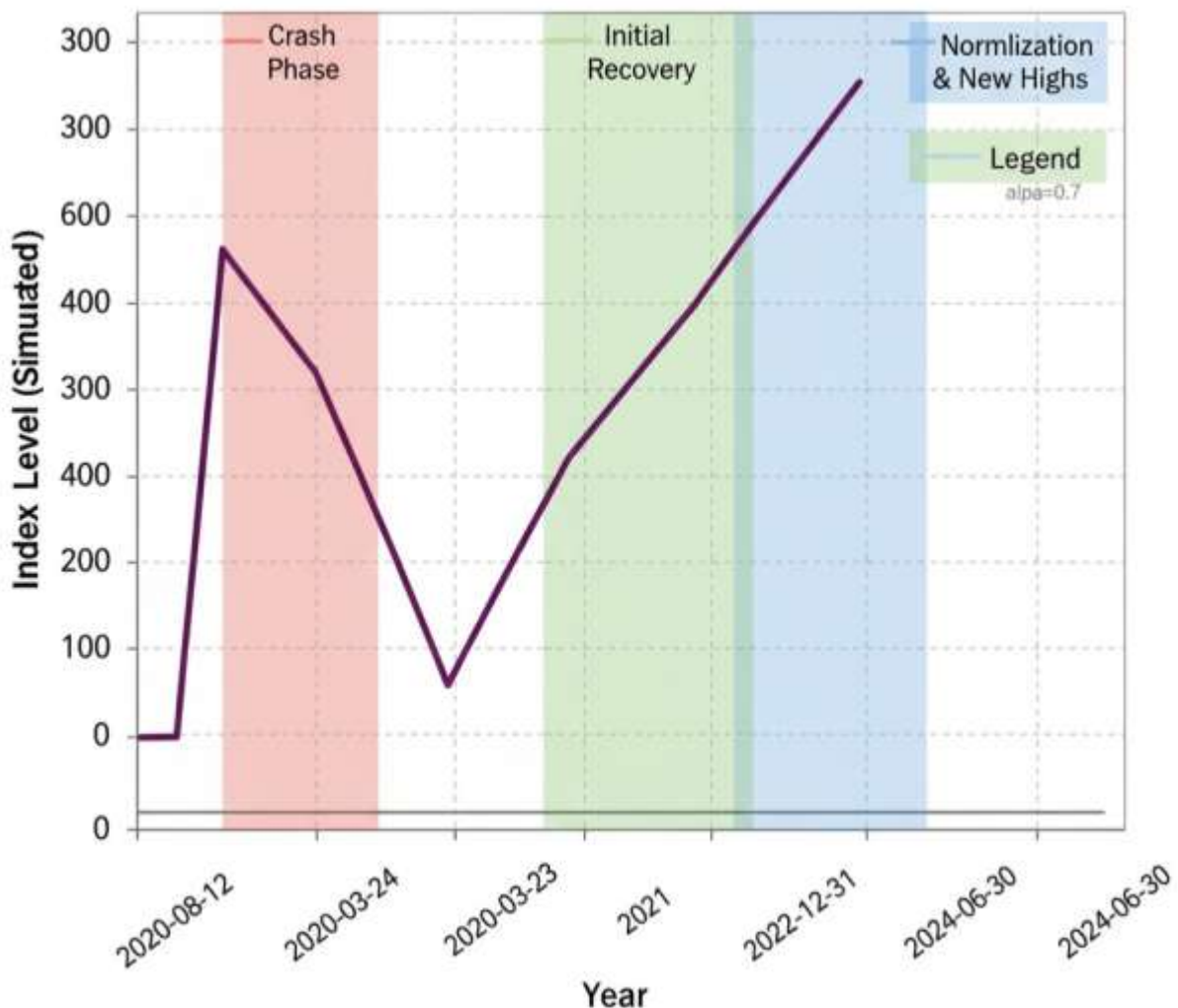

Figure 2: V-Shaped Recovery and Long Term Trajectory of the Indian Stock Market (Nifty 50 Simulated)

Table 3: Sectoral Performance During Different Pandemic Phases

Sectoral Index	Crash Phase Return (%)	Initial Recovery Return (%)	Overall Return (Feb '20 - Jun '24) (%)
Nifty Pharma	-15.4	+95.2	+188.5
Nifty IT	-24.1	+110.7	+174.3
Nifty FMCG	-20.5	+45.8	+98.9
Nifty 50 (Benchmark)	-32.8	+84.5	+112.4
Nifty Auto	-47.2	+75.1	+65.8
Nifty Bank	-49.5	+70.3	+58.1
Nifty Realty	-52.8	+35.6	+12.4

Table 3 highlights the clear winners and losers. The Pharmaceutical sector was a direct beneficiary, driven by demand for healthcare products, vaccines, and medicines (Mazur et al., 2021). The Information Technology sector thrived as digital transformation accelerated globally, boosting demand for IT services. The FMCG sector proved defensive due to stable demand for essential goods.

Conversely, the Banking sector was hammered by fears of rising non-performing assets (NPAs) and a moratorium on loan repayments. The Auto and Realty sectors, being highly dependent on physical movement, discretionary spending, and supply chains, suffered the most severe contractions. The following bar chart visualizes this sectoral divergence during the critical crash and initial recovery phases.
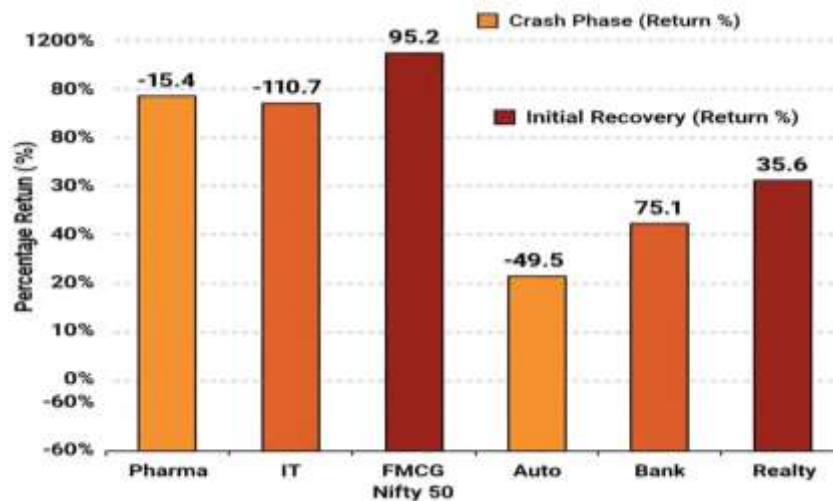
Figure 3 : Crash Vs Initial Recovery Phases

5. Conclusion and Policy Implications

This study provides a comprehensive empirical analysis of the impact of the COVID-19 pandemic on the Indian stock market from 2020 to 2024. Our findings lead to several key conclusions.

First, the initial shock was severe and statistically significant, with the market losing over a third of its value following the lockdown announcement. This underscores the sensitivity of emerging markets to extreme exogenous shocks and policy decisions.

Second, the Indian stock market demonstrated remarkable resilience, staging a V-shaped recovery that surpassed pre-pandemic levels within a year and continued to grow. This highlights the role of swift policy intervention by the RBI and the government, alongside robust global liquidity, in restoring investor confidence.

Third, and perhaps most importantly, the pandemic acted as a great differentiator among sectors. The crisis accelerated pre-existing trends, benefiting sectors aligned with digitalization and healthcare while severely punishing those tied to physical infrastructure and discretionary spending.

5.1. Implications

- For Investors: The findings emphasize the importance of diversification and sectoral allocation. During systemic crises, a defensive portfolio tilt towards resilient sectors (Pharma, IT, FMCG) can mitigate losses. The recovery also presents opportunities in cyclical sectors (Bank, Auto) for contrarian investors with a long-term horizon.
- For Corporate Managers: Companies must build agile and resilient business models capable of withstanding black swan events. Accelerating digital adoption and strengthening supply chains are no longer optional but essential for risk management.
- For Policymakers and Regulators: The effectiveness of monetary and fiscal stimulus in stabilizing financial markets is clear. However, targeted support for the most vulnerable

sectors may be necessary in future crises to ensure a more balanced recovery and prevent long-term economic scarring.

A limitation of this study is its focus on aggregate and sectoral indices; future research could delve into firm-level characteristics that influenced stock performance during the pandemic. Nevertheless, this analysis offers a valuable longitudinal perspective on one of the most significant economic events of the 21st century and its profound impact on India's financial landscape.

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